

**International Lake Superior  
Board of Control  
Semi-Annual Progress Report to the  
International Joint Commission  
Covering the Period March 10, 2005 to September 20, 2005**

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# International Lake Superior Board of Control

## Canada

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David Fay, Secretary

## United States

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John W. Kangas, Secretary

20 September 2005

International Joint Commission  
Ottawa, Ontario  
Washington, D.C.

Commissioners:

This semi-annual report covers the Board's activities from 10 March to 20 September 2005.

## **1. Highlights**

During the past six months, the water levels of Lakes Superior and Michigan-Huron remained below average. Though levels were significantly higher than those of the last year at the start of the reporting period, they have since fallen below those of the past year due to the very dry conditions during the past six months.

The Lake Superior outflows were as specified by Regulation Plan 1977-A, except in August. Flow measurements conducted at the Compensating Works during August 3 to 10 resulted in a 160 m<sup>3</sup>/s over-discharge for the month as gate settings varied from one-half to seven gates fully open during the series of measurements. Since March, the monthly outflows from the Lake have been between 101% and 135% of average. Meanwhile, the monthly outflows from Lakes Michigan-Huron ranged from 88 to 95% of average. Water supplies to the entire region over the six month period were persistently well below normal, except during June, when the Lake Superior basin received above normal supplies.

The power entities have been permitted to conduct ponding operations each weekend and holiday during the reporting period.

As previously reported, a navigation interest proposed that the threshold level for peaking and ponding decisions could be lowered a foot (30 cm) following completion of dredging in the lower St. Marys River. A letter was mailed 28 October 2004 to key affected interests and posted on the IJC web site seeking public comment on changing the threshold. The Board received a letter from a fisheries biologist at the Michigan Department of Natural Resources requesting additional research into any possible effects on the aquatic environment.

A full inspection and level survey of the Compensating Works (conducted every five years) was

undertaken from 24 to 26 May. Results demonstrated no major problems above the water line, but some cracking/gaps in the upstream concrete apron on the U.S. side were noted in the underwater video. Overall the structure is in good condition. Some minor maintenance is needed and this has been incorporated into the owners' maintenance plans.

Verification flow measurements were made by the Board from 1 to 4 June at all three hydropower plants. Measurements in the ESEC and U.S. Government power canals were to verify recently revised plant software. Measurements in the Great Lakes Power Limited (GLPL) power canal were done as part of the Board's scheduled five year verification cycle. Preliminary analysis of the measurement data suggests that the GLPL and ESEC plant reports appear to be within an acceptable range. The U.S. Government plant reported data appears to be outside the acceptable range and requires additional analyses.

A draft Upper Lakes Plan of Study was released to the public on 25 August. In September, Board representatives attended the four public consultation meetings hosted by the Plan of Study Revision Team. The final Plan of Study will be presented to the Commission on 14 October.

The Board is prepared to offer assistance in conducting the study. This would include technical data and upper lakes hydrologic modeling, and operating experience in Lake Superior outflow regulation.

## **2. Monitoring of Hydrologic Conditions**

The Board, through its staff, continuously monitors the water levels of Lakes Superior and Michigan-Huron, and the water levels and flows in the St. Marys River. The Regulation Representatives' monthly reports to the Board provide hydrologic assessments and recommendations on the regulation of outflows from Lake Superior. These reports indicate the amount of water available for hydropower purposes, after the requirements for domestic use, navigation, and the fishery (St. Marys Rapids) were met.

Tables 1 and 2 list the recent monthly water levels, net basin supplies, and outflows for lakes Superior and Michigan-Huron, respectively. Figure 1 compares the monthly water levels for this period to long-term averages and extremes. Figure 2 shows the monthly precipitation over the lakes Superior and Michigan-Huron basins. Figure 3 shows the monthly net basin supplies for the basins.

Apart from slightly wetter than normal conditions in May and June, precipitation over the Lake Superior basin was below average for the past six months (78% of average). The net basin water supplies, which are the net effect of precipitation, evaporation and runoff to the lake, were also below average except in June.

Lake Superior's levels remained above chart datum (183.2 m or 601.1 ft.) throughout the reporting period. Its levels over the past six months ranged from 2 to 15 cm (1 to 6 in.) below average. On 20 September, its level was at elevation 183.37 m (601.61 ft.), which was 18 cm (7 in.) below average and 10 cm (4 in.) lower than last year.

Precipitation over the Lakes Michigan-Huron basin was persistently below average in each of the past six months (75% of average). The Lakes Michigan-Huron net basin water supplies were also well below average. Exceedence probabilities ranged from 71 to 97%.

Monthly mean Lake Michigan-Huron levels ranged from 23 to 42 cm (9 to 17 in.) below long-term averages, but remained above chart datum (176.00 m or 577.4 ft.), over the past six months. Lakes Michigan-Huron levels have been relatively consistent recently. On 20 September, Lakes Michigan-Huron were at elevation 176.07 m (577.66 ft.), 45 cm (18 in.) below average and 18 cm (7 in.) lower than one year ago.

### **3. Regulation of the Outflow from Lake Superior**

The outflows of Lake Superior were as specified by Regulation Plan 1977-A during the past six months except for an over-discharge in August to accommodate flow measurements at the Compensating Works.

The gate setting at the Compensating Works supplying the main portion of the St. Marys Rapids was at a five gate open setting for the month of July, as specified by Plan 1977-A. This was the largest gate open setting since 1997. With the approval of the Commission, the gate setting was varied between one and seven gates open during the series of flow measurements from August 3<sup>rd</sup> to 10<sup>th</sup>. The gate setting for the remainder of the reporting period was one-half gate open. Gate 1, which supplies water to the Fishery Remedial Works, remained set at 15 m<sup>3</sup>/s (530 cfs).

The flow measurements conducted at the Compensating Works in August resulted in a 160 m<sup>3</sup>/s over-discharge for the month. Though Plan 1977-A had prescribed a one gate open setting at the Compensating Works for the month of August, the actual settings over the first ten days were varied to make measurements at settings from one to seven gates. The setting was left at one-half gate open for the balance of the month in order to minimize the over-discharge deviation the Commission had approved due to these important measurements.

Lake Superior outflows were 110% of average over the last six months, ranging from 1,990 m<sup>3</sup>/s to 3,080 m<sup>3</sup>/s (70,300 cfs to 108,800 cfs). Outflows were limited by Criterion (c) of the Orders from March through June.

Flow reductions were necessary on 21 to 22 May to facilitate replacement of the Fort Street Bridge over the Edison Sault Electric Company (ESEC) power canal. Flows were reduced to 140 m<sup>3</sup>/s (5,000 cfs) for 22 hours. These reductions were able to be offset by increased flows within the same month. Maintenance work at an ESEC sub-station also necessitated flow reductions at their plant from 20 to 22 June. ESEC's flow was reduced to as low as 450 m<sup>3</sup>/s (16,000 cfs) during this period. Likewise, these reductions were offset within the same month.

Maintenance work at the U.S. Government Plant (USGP) also necessitated flow reductions from 21 to 23 June that were easily offset within the month.

A series of scheduled maintenance outages were undertaken at the Great Lakes Power Ltd (GLPL) plant. One unit was shut down from 14 to 23 May and another from 26 to 29 May. A water sharing agreement with ESEC permitted the power entities to pass their full allotment that month.

On 24 July, interruptions in the electrical transmission system caused the units at the GLPL plant to shut down for a brief period.

No significant problems related to water levels were reported as a result of these flow variations.

#### **4. Governing Conditions During the Reporting Period**

The monthly mean levels of Lake Superior ranged between 183.22 and 183.42 m (601.1 and 601.8 ft.) during the reporting period, well within the limits of 182.76 and 183.86 m (599.6 and 603.2 ft.) specified in the Commission's Orders of Approval.

During the reporting period, the daily mean water levels in the lower St. Marys River at the U.S. Slip gauge downstream of the U.S. Locks, varied between 176.15 and 176.80 m (577.9 and 580.1 ft). Therefore, the requirement for maintaining the level below 177.94 m (583.8 ft.) was satisfied. The daily mean U.S. Slip level fell below chart datum (176.39 m or 578.71 ft.) on eight days (between 13 April and 21 May, and again on 20 September).

#### **5. Repairs, Inspection, and Flow Calibration at the Compensating Works**

The U.S. Army Corps of Engineers and Environment Canada conducted flow measurements to verify/update the stage-discharge rating relationships for the Compensating Works from the 3<sup>rd</sup> to the 12<sup>th</sup> of August. This was the first time since July 2001 that flow measurements have been performed at the structure. The initial gate opening on 3 August was five gates fully open (i.e., the July setting). Then, the setting was increased to seven gates open on 4 August, then reduced to six on 5 August, four on 6 August, three on 8 August, two on 9 August, one on 10 August, and one-half on 11 August. The setting was returned to the equivalent of one-half gate open on 12 August, which was maintained for the balance of the month. Measurement results are being analyzed and a report detailing the program and rating update will be provided to the Board prior to its spring 2006 meeting.

A full five year inspection and level survey of the structure, including underwater inspections, was undertaken from 24 to 26 May. Findings demonstrate no major problems above the water line, but some cracking and gaps in the upstream concrete apron on the U.S. side were noted in the underwater video. Overall, the structure is in good condition. On the U.S. side, some minor maintenance is needed, including clearing of embankment slopes; removal of a concrete obstruction from the upstream side of Gate #11; and cleaning, lubrication, and painting of equipment as necessary. This work has been included in the U.S. maintenance plan. Cracks along the gate sills and leakage at the gate seals will be monitored with routine remotely operated vehicle (ROV) camera surveys. Additional planned work includes installation of signage lighting, updates of the Emergency Notification Plan and Emergency Operations Plan,

and development of a maintenance tracking system. On the Canadian side of the structure, steel nose plates will be installed on three upstream piers this fall. Safety fences and signage were installed in late August along the northern abutment to discourage swimming downstream of the gates in the vicinity of the rail bridge. Complete re-painting of the Canadian gates and mechanisms is scheduled for the 2007-2010 period by GLPL.

In addition, ongoing routine maintenance and inspections of the Compensating Works were undertaken in the past six months. The structure is generally in good condition.

## **6. Repairs, Maintenance, and Flow Determination at the Hydropower Facilities**

### *a. U.S. Government Hydropower Plant*

The system used to compute flows at the U.S. Government hydropower plant (USGP) was completely re-developed previously as part of the plant automation program. Verification flow measurements were made for the Board from 1 to 4 June. Data are being analyzed and a report on the findings will be provided to the Board by the end of December 2005. Preliminary analysis of the data suggests that the plant reports appear to be outside the acceptable range, however additional analyses are required to confirm this finding.

U.S. Government Plant generators were out-of-service at various times during the reporting period for routine testing, maintenance and repair. From 18 to 22 April, Unit 3 was down for 105 hours for inspection and overhaul; from 2 to 3 May, Unit 10 was down for 33 hours for governor repairs; from 7 to 8 June, Unit 3 was down for 33 hours for governor repairs; from 20 to 23 June, Units 1 and 2 were down for 33 hours each (one at a time) for governor repairs; and from 25 to 26 June Unit 3 was down for 33 hours for testing. Edison Sault Electric Company was able to utilize the unused portions of the government plant's allocations.

### *b. Great Lakes Power Limited*

Verification flow measurements were also undertaken for the Board in the Great Lakes Power Limited (GLPL) power canal on 1, 3, and 4 June in accordance with the scheduled five year verification cycle. Data are being analyzed and a report on the findings will be provided to the Board by the end of December 2005. Preliminary analysis of the data suggests that the plant reports appear to be within an acceptable range.

A series of scheduled maintenance outages were undertaken at the GLPL plant. Unit G1 was shut down from 14 to 23 May and Unit G3 was shut down from 26 to 29 May. These planned outages did not affect total monthly outflows from the lake. Unit G2 at GLPL is scheduled to be shut down from 19 September to 25 October for annual inspection as well as governor, unit controls, and static excitation upgrades.

### *c. Edison Sault Electric Company*

Analysis of the Board's July 2004 flow measurements in ESEC's power canal indicated that

ESEC's reporting system both over- and under-reported flows depending on the flow regime. On 9 March 2005, the Board approved the use of revised software which brought ESEC's recomputed flows very close to the flows measured in July 2004. Verification flow measurements were made by the Board from 1 to 4 June 2005. Data are being analyzed and a report on the findings will be provided to the Board by the end of December 2005. Preliminary data analysis suggests that the plant reports appear to be within an acceptable range.

## **7. Water Usage in the St. Marys River**

Table 3 (Table 4 in U.S. Customary units) lists the distribution of outflows from Lake Superior for January 2004 to August 2005. Water uses are divided into four categories: domestic, navigation, fishery, and hydropower. According to the 1979 Supplementary Order, after the first three water requirements are satisfied, the remaining outflow is shared equally between the U.S. and Canada for hydropower purposes. Any remainder, beyond the flow capacity of the hydropower plants, is discharged through the Compensating Works into the St. Marys Rapids.

As shown in the tables, the monthly mean amounts of water used for domestic and industrial purposes ranged from 8 to 12 m<sup>3</sup>/s (283 to 424 cfs), which is roughly 0.3% of the total monthly outflow.

In March 2005, Algoma Steel advised Board staff that they had discovered a reporting error and that the amount of water actually withdrawn from the Upper St. Marys River was not being correctly accounted for in their estimate each month. The amount that had been reported was roughly 3 m<sup>3</sup>/s (106 cfs). It should have been on the order of 7 to 12 m<sup>3</sup>/s (247 to 424 cfs). For an unknown number of years, Algoma Steel had been reporting the estimated water withdrawn from their canal for various unit processes in lieu of the actual amount pumped into the canal from the Upper River (water withdrawn from their canal for those various processes plus the unused portion that is discharged downstream). Staff at Algoma Steel were able to provide Board staff with corrections as far back as 1994, but were unable to determine when the reporting errors had commenced (prior to that year). The Board's records of total outflows from Lake Superior and calculated supplies have been updated and corrected back to 1994. Note that these corrections are very small and amount to only 0.2% of the total river flow.

The flow through the U.S. and Canadian locks depends on traffic volume and varied from 4 to 18 m<sup>3</sup>/s (141 to 636 cfs). As a percentage of the total river flow, water allocated for navigation varies seasonally from as little as 0.1% (when the locks are closed for the winter) to about 0.8% of the total river flow in the busiest part of the navigation season.

The U.S. locks opened, as scheduled, on 25 March. The Canadian locks opened, as scheduled, on 15 May.

In accordance with the Commission's Orders to fulfill the fishery needs in the main rapids, a minimum gate setting of one-half gate open is required at all times at the Compensating Works.

In addition, a flow of at least 15 m<sup>3</sup>/s (530 cfs) is required in the Fishery Remedial Works (through Gate 1). A setting equivalent to one-half gate open for the main rapids is maintained by having four gates partially open to supply the same quantity of water as one gate half open. This spreads the flow more evenly across the main rapids, and is thought to reduce potential damage from ice floes impacting the gate in the winter. The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, ranged from 100 to 800 m<sup>3</sup>/s (3,530 to 28,300 cfs) over the last six months. During July, a setting of five gates fully open was employed. During a series of flow measurements, the settings varied between one-half gate and seven gates fully open during 3 to 12 August. Gate No. 1 remained set at 15 m<sup>3</sup>/s (530 cfs). Combined flows in the rapids made up from 5.7% to 26.4% of the total river flow, with the higher value only occurring when the total flow was beyond the capacities of the hydropower plants.

The hydropower plants used an average of 2,066 m<sup>3</sup>/s (73,000 cfs) from March to August 2005 for electric power production. The allocation for this period averaged 2,078 m<sup>3</sup>/s (73,380 cfs). This is about 88.4% of the total river flow, on average. Usages at each plant are shown in Tables 3 and 4.

## **8. Long Lac and Ogoki Diversions**

Ontario Power Generation (OPG) continued to provide the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversions into Lake Nipigon (which flows into Lake Superior) averaged 178.0 m<sup>3</sup>/s (6,290 cfs) and the Long Lac Diversion averaged 33.2 m<sup>3</sup>/s (1,170 cfs) over the reporting period. Combined, these diversions were about 126 percent of average for the period 1944-2004.

Due to high Lake Nipigon levels, some Ogoki River discharge was spilled northward during March and April to minimize impacts on the lake. Average spillage during these two months was equivalent to 22.0 m<sup>3</sup>/s (780 cfs).

Since 1999, a continuous flow of at least 2 m<sup>3</sup>/s (70 cfs) is maintained during the summer (mid-May through about Labour Day) from the north outlet of Long Lake. This agreement between OPG and the local First Nations provides water for environmental enhancement of the Kenogami River, and reduces the amount diverted to Lake Superior. Additional water was spilled northward from Long Lake during the months of May and June at average extra discharges of 12.0 (420 cfs) and 0.9 m<sup>3</sup>/s (30 cfs), respectively.

## **9. Peaking and Ponding Operations at Hydropower Plants**

Flow variations at the hydropower plants at Sault Ste. Marie cause the water levels to fluctuate in the St. Marys River downstream of the plants. With the water levels and Lake Superior outflows below average, the fluctuations were a concern for commercial navigation users in recent years. The Board submitted an update report on 27 January 2004, noting that the interim guidelines and the mechanism for disseminating information to the public appeared to be working very well.

On 4 May 2004, the IJC granted an extension of peaking and ponding operations until 20 March

2006. The Board is to provide a report on 2004 and 2005 operations by 23 January 2006.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. U.S. Slip weekend minimum levels, which are those affected by ponding operations, were expected to remain above chart datum. As a result, ponding operations were allowed by the hydropower companies throughout the period consistent with the interim guidelines.

Navigation interests indicated in comments provided for the 27 January 2004 report to the Commission on peaking and ponding that, when dredging in the lower St. Marys River was complete, consideration be given to establishing Low Water Datum minus one foot (0.3 m) as the reference level for suspension of ponding decisions. With dredging completed, a request for public comment on lowering the threshold level was sent out 28 October 2004. Three responses were received in support of the proposal. One response from a fisheries biologist at the Michigan Department of Natural Resources requested additional research into any the possible effects on the aquatic environment prior to implementation of the proposal. ESEC has recently forwarded to the Board a critical review conducted by Dr. R. Marshall Werner of Lake Superior State University of the concerns raised in the Michigan Department of Natural Resources letter. The Board will forward Dr. Werner's report to the Michigan Department of Natural Resources. The proposed Upper Lakes Plan of Study includes an assessment of the impacts of peaking and ponding.

To provide timely information to the users, the Corps distributes monthly notices on expected Lake Superior outflows, and a schedule of flow variations at the hydropower plants.

## **10. Annual Meeting with the Public and Public Information**

The Board held its annual meeting with the public on the evening of 12 July. A multi-site format with a portion joined by teleconference was used again in an effort to gain feedback from and encourage interaction among people across the upper Great Lakes. Two sites were linked simultaneously during this event: Midland, Ontario and Sault Ste. Marie, Michigan. A total of about 100 members of the public and the media, plus Board and IJC representatives, were in attendance at the two locations (25 at Sault Ste. Marie and about 75 in Midland). A similar presentation was given at each site that described the IJC, the Board, the regulatory structures, the regulation plan, and the current and expected water levels. Both meetings were then opened for public comment, questions, and concerns to be shared with the other sites. The sites were then linked by audio conference call, with Canadian Member, Carr McLeod, chairing. Each site was asked to share its comments and concerns.

The attendees were generally displeased with the below average water levels. Concerns included the impact of low levels (and isostatic rebound) on boating and access and use of shore properties, wetlands, businesses, shoreline erosion and poor water quality. Several attendees at the Soo site expressed concern about the large change in the flow in the St Marys Rapids caused by a change from a one-half gate open setting in June to a five gate open setting in July as prescribed by Plan 1977-A. Attendees at the Georgian Bay location appeared most concerned

about actions being taken to address the findings of the Georgian Bay Association sponsored report on potential flow capacity increases in the St. Clair River. These concerns included the funding and scheduling of the Upper Lakes Study (ULS) and the re-scoping of the Plan of Study to examine that issue. Most attendees expressed their appreciation for the multi-site meetings.

In addition to the concerns expressed at the public meeting in Sault Ste. Marie, the Board also received several phone calls and a letter of complaint regarding the higher flows in the St Marys Rapids due to multiple-gates-open settings at the Compensating Works in July and August. Several fishery biologists, lamprey trapping scientists, and anglers expressed concerns about the large and abrupt change in the flow in the St Marys Rapids from June to July and the impact this might have on the fish in the rapids. Although a press release warning of the change was issued a few days prior to the gate openings, some did not think that provided sufficient notice. Board staff were not able to issue the media release earlier due to the high degree of uncertainty as to whether or not a multiple gates open setting would, indeed, be prescribed by the Plan. Some suggested that such large gate open settings at the Compensating Works be either delayed so as not to affect anglers or at least phased in over a longer period. Anglers claimed that such large releases limit fishing in the Rapids, and that anglers had cancelled plans resulting in a loss in tourism revenue to the region. The Board suggested that this issue be analyzed during the proposed Upper Lakes Study. The lamprey scientist was concerned that having more gates open would affect the success rate at their traps below the hydropower facilities as they feared that the lamprey would be attracted by the higher flows in the St Marys Rapids.

The Board proposes to hold its next meeting with the public in the summer of 2006 with sites at Sault Ste. Marie, Michigan and a location on Georgian Bay. To broaden the access for the public, the feasibility of a video-teleconference link between the Sault Ste. Marie site and a room at the Duluth area office of the Corps of Engineers is being investigated for next year's public meeting.

The Board continues to issue, at the beginning of each month, news releases informing the public about Lake Superior regulation and water level conditions. The Board provides monthly media releases and hydrologic update information to the Commission to maintain a Board web site. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports, meeting minutes and hydrologic data summaries. In addition, in support of the Board and the Commission, the Detroit District Corps of Engineers maintains additional technical information on its own Board Web site.

## **11. Upper Lakes Plan of Study Revision**

In May 2005, the Commission appointed a bi-national team to update the 2002 Plan of Study (POS) to review the operation of the structures controlling Lake Superior's outflows and the current outflow regulation plan. Since the 2002 POS had not yet been funded by Governments, the Commission added three new tasks to the revision: (1) to examine physical processes and possible ongoing changes in the St. Clair River and their impacts on Lakes Michigan-Huron; (2) to incorporate lessons learned from the Lake Ontario – St. Lawrence River Study; and (3) further

streamline the existing POS. Prior to the appointment of the revision team, the Board discussed this issue with the Commission and expressed support for expanding the purpose of the study.

A draft POS was released to the public on 25 August. In September, Board representatives attended a series of four public consultation meetings hosted by the Plan of Study Revision Team. The technical staff of the Board reviewed the Team's draft revised POS, the study tasks proposed, and provided comments to the Revision Team. The Board appreciates the Commission taking action on this matter and is confident the study will ensure Lake Superior outflow regulation continue to take into account the needs of the interests in the upper Great Lakes system.

The final POS is due to be presented to the Commission on 14 October 2005. The decision to proceed with an Upper Lakes Study rests with the approval of funding by the Governments.

The Board is prepared to offer assistance in conducting the study. This would include technical data and upper lakes hydrologic modeling, and operating experience in Lake Superior outflow regulation.

## **12. U.S. Navigation Improvements and Studies**

While the following items are not under the jurisdiction of the Commission, they are of interest to the Board and its operations. Status reports on the following items are provided to keep the Commission informed.

### *a. Great Lakes / St. Lawrence Seaway Study*

Work continues on the *Great Lakes / St. Lawrence Seaway Study*. The Study is looking at the engineering aspects and cost of maintaining the present system over the next 50 years. The Study is also looking at the implication this has on the system's economy and environment. No expansion of locks or connecting channel size is being addressed. The study team is almost two-thirds of the way through a 42 month supplemental phase. The engineering team, led by the Corps, has completed the analysis of the infrastructure and is in the process of finalizing the ranking of various components in order to focus more detailed reliability analyses on the most critical components. The economic team, led by Transport Canada, has completed transportation rate and elasticity analyses (to define at what point shippers might choose an alternative mode of transport), begun development of a historic database of traffic and vessel information, and has initiated a new vessel/cargo study to be used for forecasting future traffic scenarios. The environmental team, co-led by the Corps, Transport Canada, and the US Fish and Wildlife Service, has completed initial characterization of several key resources which are susceptible to navigation related impacts and have begun developing the baseline for use in assessing potential impacts associated with continued operation and maintenance of the system. The funding for the current fiscal year is significantly less than required to meet current timelines. Availability of future funding may impact study progress. The Board will continue to monitor the progress and update the Commission as appropriate in future reports.

environmental team, co-led by the Corps, Transport Canada, and the US Fish and Wildlife Service, has completed initial characterization of several key resources which are susceptible to navigation related impacts and have begun developing the baseline for use in assessing potential impacts associated with continued operation and maintenance of the system. The funding for the current fiscal year is significantly less than required to meet current timelines. Availability of future funding may impact study progress. The Board will continue to monitor the progress and update the Commission as appropriate in future reports.

*b. Lock Replacement at Sault Ste. Marie, Michigan*

On 18 February 2005, Headquarters USACE forwarded the Final Limited Re-evaluation Report (LRR) to the Assistant Secretary of the Army (ASA) for review and approval. The Board will continue to monitor the project progress and update the Commission as appropriate in future reports.

**13. Sea Lamprey Control**

The Great Lakes Fishery Commission (GLFC) and the Sea Lamprey Control Centre (SLCC) did not request flow adjustments or other assistance from the Board to carry out its sea lamprey control program during the last six months. However, the US Fish and Wildlife Service, did express a concern that the higher flow in the St Marys Rapids in July might adversely impact the lamprey trapping efficiency. Board staff, in a teleconference with them, requested any analysis that might become available on the trapping efficiency during the increased rapids flows. Board staff also suggested that this might be an issue for the Upper Great Lakes Study to consider. US Fish and Wildlife Service sent a letter to the Board on July 21 requesting the opportunity to comment on the plan to revise the regulation plan regarding sea lamprey trapping.

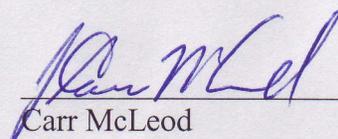
ESEC is continuing to cooperate with the US Fish and Wildlife Service in coordinating the installation of two sea lamprey traps in their tailrace. The U.S. Government main plant and Unit #10 and GLPL's Clergue plant continue to cooperate by allowing placement of sea lamprey traps in their tailraces as well.

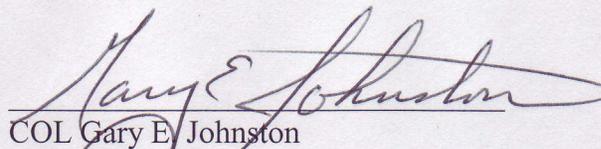
**14. Board Membership and Meetings**

There was no change in the Board membership during the reporting period.

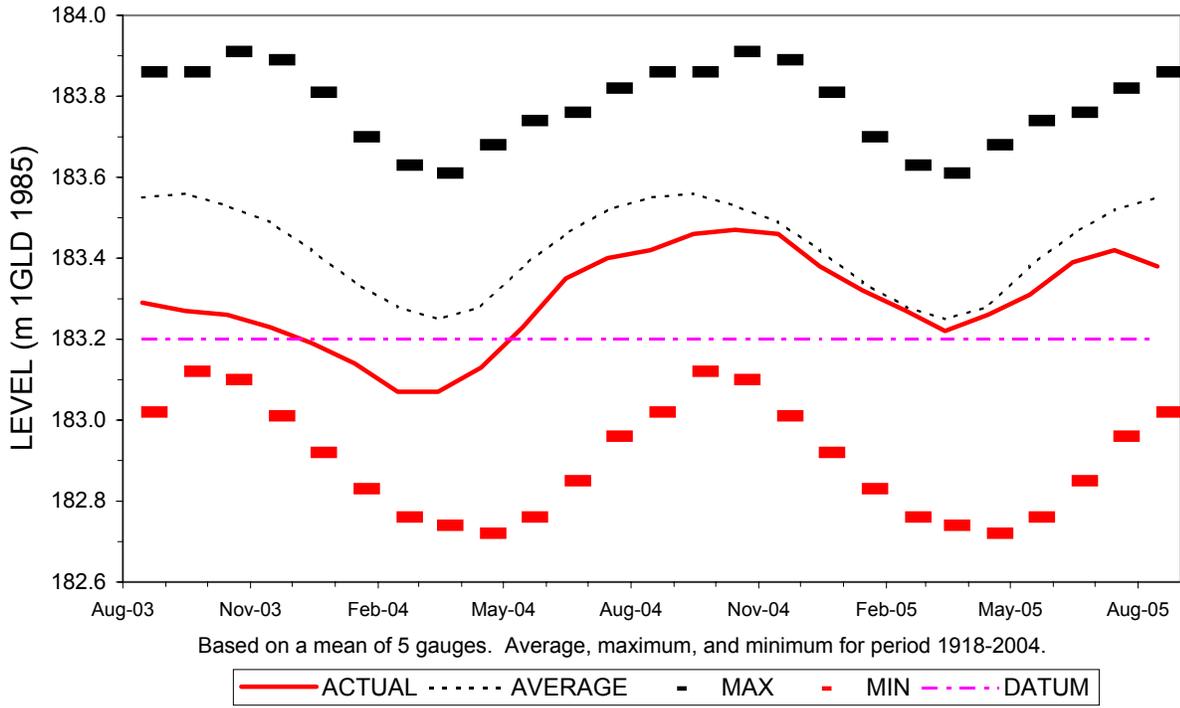
The Board held a meeting on 20 September in Niagara Falls, Ontario, with the Canadian member and U.S. alternate member in attendance.

Respectfully submitted,

  
Carr McLeod  
Member for Canada

  
COL Gary E. Johnston  
Alternate Member for United States

### LAKE SUPERIOR MONTHLY WATER LEVELS



### LAKES MICHIGAN-HURON MONTHLY WATER LEVELS

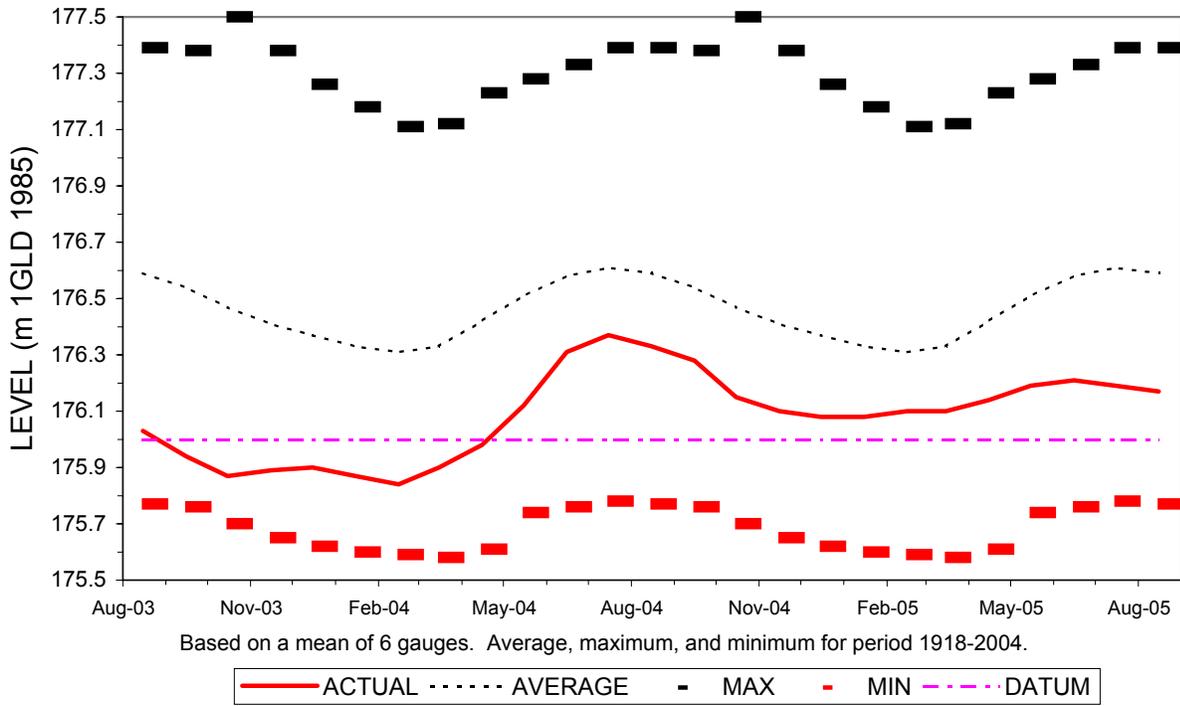
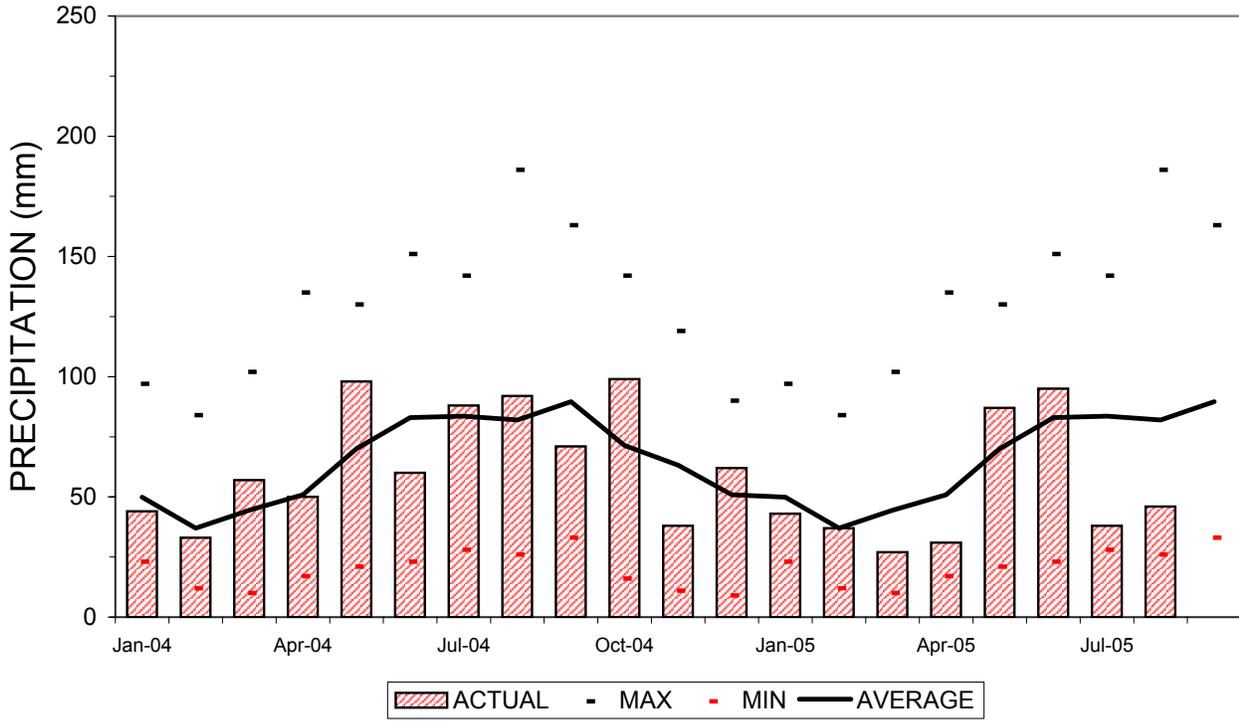
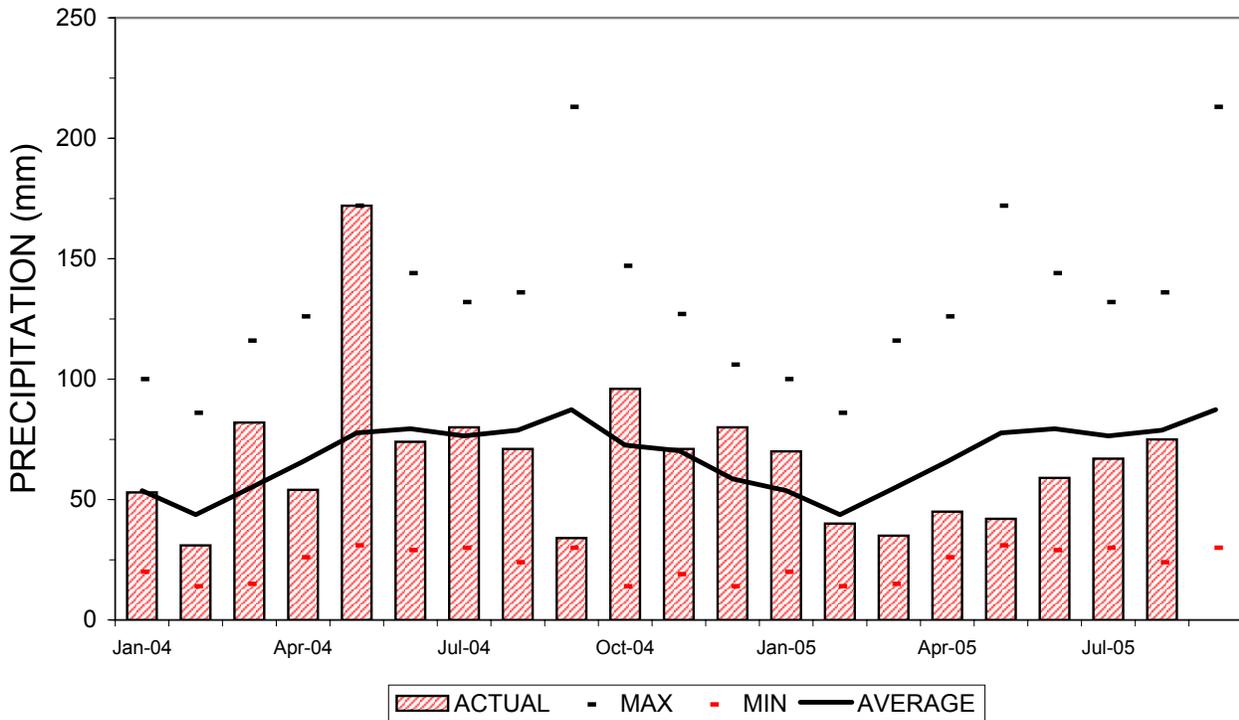


Figure 1

### LAKE SUPERIOR MONTHLY PRECIPITATION



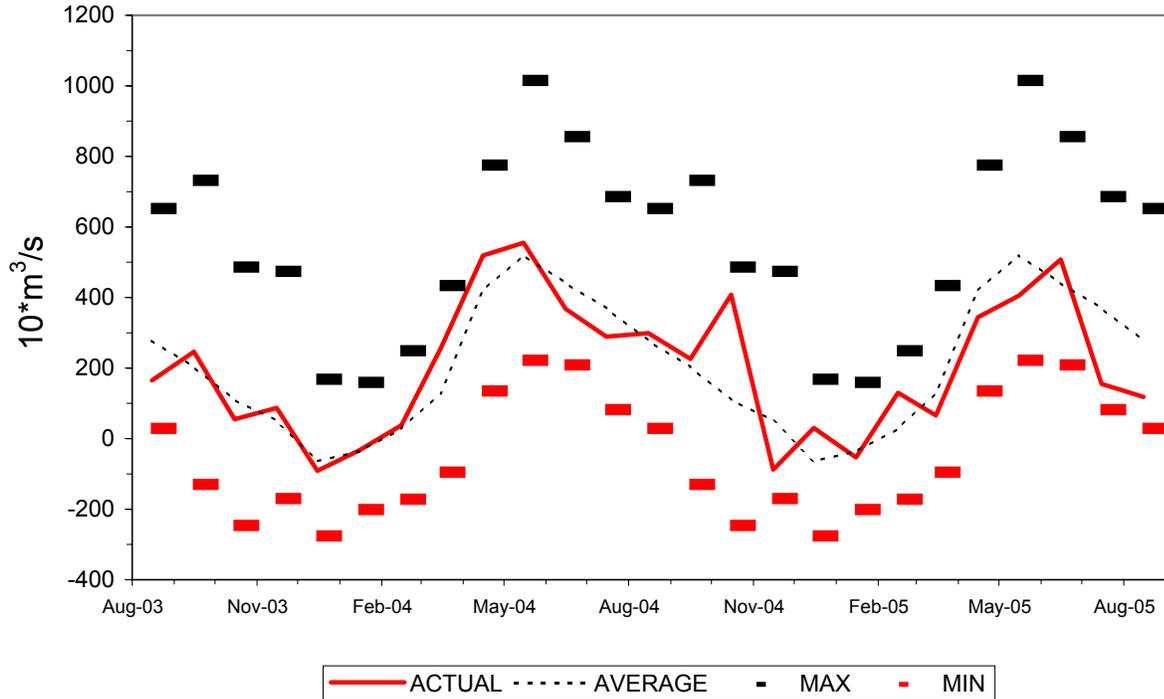
### LAKES MICHIGAN-HURON MONTHLY PRECIPITATION



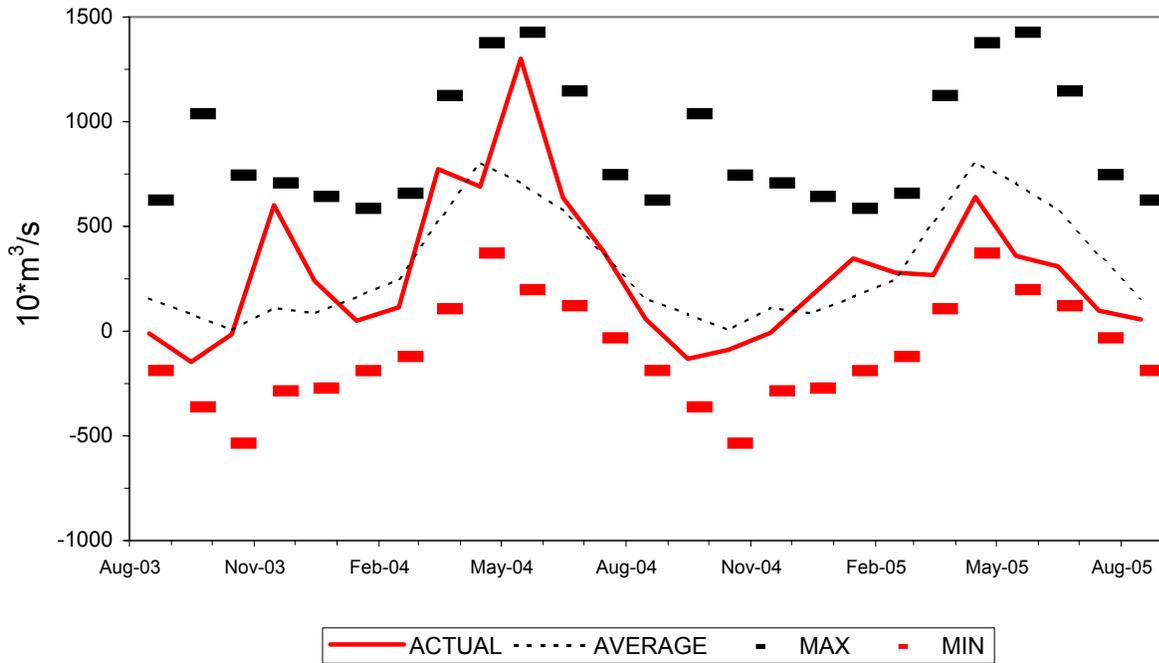
Average, maximum and minimum values based on period of record 1900-2004.

Figure 2

### LAKE SUPERIOR MONTHLY NET BASIN SUPPLIES



### LAKES MICHIGAN-HURON MONTHLY NET BASIN SUPPLIES



Average, maximum and minimum values based on coordinated period of record 1900-1999.

Figure 3

TABLE 1. 2004-2005 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability <sup>3</sup> (%)	Monthly Mean Recorded		Percent of Average <sup>4</sup>
	metres	feet	metres	feet	m3/s	tcfs		m3/s	tcfs	
Apr-04	183.13	600.82	-0.15	-0.49	5190	183	24	1840	65	94
May-04	183.23	601.15	-0.15	-0.49	5550	196	40	2020	71	95
Jun-04	183.35	601.54	-0.11	-0.36	3680	130	66	2220	78	101
Jul-04	183.40	601.71	-0.12	-0.39	2890	102	74	2260	80	99
Aug-04	183.42	601.77	-0.13	-0.43	2990	106	41	2280	81	96
Sep-04	183.46	601.90	-0.10	-0.33	2260	80	40	2330	82	99
Oct-04	183.47	601.94	-0.06	-0.20	4080	144	2	2260	80	98
Nov-04	183.46	601.90	-0.03	-0.10	-880	-31	88	2360	83	104
Dec-04	183.38	601.64	-0.04	-0.13	300	11	13	2250	79	109
Jan-05	183.32	601.44	-0.02	-0.07	-530	-19	58	2080	73	107
Feb-05	183.27	601.28	-0.01	-0.03	1300	46	10	2030	72	106
Mar-05	183.22	601.12	-0.03	-0.10	660	23	69	2020	71	107
Apr-05	183.26	601.25	-0.02	-0.07	3440	121	69	1990	70	102
May-05	183.31	601.41	-0.07	-0.23	4050	143	74	2140	76	101
Jun-05	183.39	601.67	-0.07	-0.23	5080	179	31	2250	79	102
Jul-05	183.42	601.77	-0.10	-0.33	1550	55	98	3080	109	135
Aug-05	183.38	601.64	-0.17	-0.56	1180	42	91	2620	93	111

Notes: m3/s = cubic metres per second                      tcfs = 1000 cubic feet per second

<sup>1</sup> Water Levels are a mean of five gauges on Lake Superior, IGLD 1985

<sup>2</sup> Average levels are for period 1918-2004, based on a mean of five gauges. Differences computed as metres and then converted to feet.

<sup>3</sup> Exceedence probabilities are based on the period 1900-1999.

<sup>4</sup> Average flows are for the period 1900-1999.

TABLE 2. 2004-2005 Lakes Michigan-Huron Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability <sup>3</sup> (%)	Monthly Mean Recorded		Percent of Average <sup>4</sup>
	metres	feet	metres	feet	m3/s	tcfs		m3/s	tcfs	
Apr-04	175.98	577.36	-0.44	-1.44	6900	244	66	4630	164	90
May-04	176.12	577.82	-0.39	-1.28	13010	459	1	4670	165	87
Jun-04	176.31	578.44	-0.27	-0.89	6380	225	35	4940	174	90
Jul-04	176.37	578.64	-0.24	-0.79	3800	134	44	5080	179	92
Aug-04	176.33	578.51	-0.26	-0.85	580	20	71	5000	177	90
Sep-04	176.28	578.35	-0.26	-0.85	-1320	-47	86	4940	174	90
Oct-04	176.15	577.92	-0.32	-1.05	-890	-31	68	4850	171	89
Nov-04	176.10	577.76	-0.31	-1.02	-80	-3	71	4870	172	91
Dec-04	176.08	577.69	-0.29	-0.95	1680	59	32	4730	167	91
Jan-05	176.08	577.69	-0.25	-0.82	3470	123	12	4120	145	91
Feb-05	176.10	577.76	-0.21	-0.69	2790	99	39	4280	151	97
Mar-05	176.10	577.76	-0.23	-0.75	2680	95	86	4610	163	95
Apr-05	176.14	577.89	-0.28	-0.92	6410	226	74	4740	167	92
May-05	176.19	578.05	-0.32	-1.05	3590	127	95	4750	168	88
Jun-05	176.21	578.12	-0.37	-1.21	3090	109	93	4800	170	88
Jul-05	176.19	578.05	-0.42	-1.38	980	35	97	4860	172	88
Aug-05	176.17	577.99	-0.42	-1.38	560	20	71	4880	172	88

Notes: m3/s = cubic metres per second                      tcfs = 1000 cubic feet per second

<sup>1</sup> Water Levels are a mean of six gauges on Lakes Michigan-Huron, IGLD 1985

<sup>2</sup> Average levels are for period 1918-2004, based on a mean of six gauges. Differences computed as metres and then converted to feet.

<sup>3</sup> Exceedence probabilities are based on the period 1900-1999.

<sup>4</sup> Average flows are for the period 1900-1999.

Table 3

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

OUTFLOW IN m <sup>3</sup> /s THROUGH														
YEAR AND MONTH	POWER CANALS				NAVIGATION CANALS				DOMESTIC USAGE			FISHERY	TOTAL LAKE SUPERIOR OUTFLOW m <sup>3</sup> /s	
	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	
2004														
JAN	380	405	785	790	1575	6.5	0.0	6	0.3	8.4	0.3	9	96	1686
FEB	390	441	831	821	1652	2.8	0.0	3	0.3	8.3	0.3	9	94	1758
MAR	398	430	828	810	1638	4.2	0.0	4	0.4	8.3	0.3	9	94	1745
APR	401	470	871	850	1721	10.3	0.0	10	0.3	8.2	0.3	9	96	1836
MAY	403	667	1070	835	1905	11.6	0.6	12	0.3	8.7	0.3	9	97	2023
JUN	403	649	1052	1039	2091	13.6	1.7	15	0.4	9.2	0.3	10	99	2215
JUL	400	667	1067	1065	2132	14.5	2.2	17	0.4	8.5	0.3	9	100	2258
AUG	398	677	1075	1077	2152	14.8	2.1	17	0.4	8.5	0.3	9	100	2278
SEP	392	705	1097	1113	2210	14.0	1.4	15	0.3	8.2	0.3	9	100	2334
OCT	370	640	1010	1128	2138	11.2	0.5	12	0.3	7.8	0.3	8	102	2260
NOV	375	762	1137	1038	2175	9.0	0.0	9	0.3	7.9	0.3	8	169	2361
DEC	401	615	1016	1106	2122	8.3	0.0	8	0.3	7.4	0.3	8	109	2247
2005														
JAN	386	563	949	1015	1964	4.3	0.0	4	0.3	7.4	0.3	8	101	2077
FEB	402	557	959	957	1916	2.1	0.0	2	0.3	7.8	0.3	8	101	2027
MAR	401	557	958	953	1911	3.8	0.0	4	0.3	7.6	0.3	8	100	2023
APR	388	547	935	933	1868	9.6	0.0	10	0.3	9.8	0.3	10	101	1989
MAY	403	709	1112	905	2017	11.7	0.6	12	0.3	10.5	0.3	11	101	2141
JUN	399	657	1056	1052	2108	13.4	1.7	15	0.4	11.0	0.3	12	112	2247
JUL	394	785	1179	1073	2252	15.5	2.3	18	0.5	11.0	0.3	12	800	3082
AUG	399	771	1170	1069	2239	13.8	2.1	16	0.4	11.5	0.3	12	358	2625

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

Table 4

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

YEAR AND MONTH	POWER CANALS					NAVIGATION CANALS				DOMESTIC USAGE		FISHERY	TOTAL LAKE SUPERIOR OUTFLOW CFS	
	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	
2004														
JAN	13400	14300	27700	27900	55600	230	0	230	11	297	11	319	3390	59500
FEB	13800	15600	29400	29000	58400	99	0	99	11	293	11	315	3320	62100
MAR	14100	15200	29300	28600	57900	148	0	148	14	293	11	318	3320	61700
APR	14200	16600	30800	30000	60800	364	0	364	11	290	11	312	3390	64900
MAY	14200	23600	37800	29500	67300	410	21	431	11	307	11	329	3430	71500
JUN	14200	22900	37100	36700	73800	480	60	540	14	325	11	350	3500	78200
JUL	14100	23600	37700	37600	75300	512	78	590	14	300	11	325	3530	79700
AUG	14100	23900	38000	38000	76000	523	74	597	14	300	11	325	3530	80500
SEP	13800	24900	38700	39300	78000	494	49	543	11	290	11	312	3530	82400
OCT	13100	22600	35700	39800	75500	396	18	414	11	275	11	297	3600	79800
NOV	13200	26900	40100	36700	76800	318	0	318	11	279	11	301	5970	83400
DEC	14200	21700	35900	39100	75000	293	0	293	11	261	11	283	3850	79400
2005														
JAN	13600	19900	33500	35800	69300	152	0	152	11	261	11	283	3570	73300
FEB	14200	19700	33900	33800	67700	74	0	74	11	275	11	297	3570	71600
MAR	14200	19700	33900	33700	67600	134	0	134	11	268	11	290	3530	71600
APR	13700	19300	33000	32900	65900	339	0	339	11	346	11	368	3570	70200
MAY	14200	25000	39200	32000	71200	413	21	434	11	371	11	393	3570	75600
JUN	14100	23200	37300	37200	74500	473	60	533	14	388	11	413	3960	79400
JUL	13900	27700	41600	37900	79500	547	81	628	18	388	11	417	28300	109000
AUG	14100	27200	41300	37800	79100	487	74	561	14	406	11	431	12600	92700

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

NOTE: Flows for individual users were originally coordinated in m3/s, and are converted here to U.S. customary units (cfs) and rounded to 3 significant figures. Total flow for each category and total Lake Superior flow in this table are computed from the individual flows in cfs.